

Claims 32-54. The cancellation of Claims and the addition of new Claims 32-54 were made in order to provide proper antecedent basis for all claims and to facilitate the review of the pending claims by the Patent Office. Therefore, Applicants do not waive their rights to interpretative equivalents of the new claims, and particularly where elements in the new claims are identical to or are no more narrow than in the original claims. No new matter is contained in the amendments or new claims. Claims 32-54 remain pending for examination. Pursuant to 37 C.F.R. § 1.121, a marked up version of the claims is attached hereto.

I. Election/Restriction Requirement

The Office Action rejected the Applicants' traversal of the restriction requirement and made the restriction requirement final. Accordingly, Applicants have cancelled Claims 11-13 and 21-31 as being directed to nonelected inventions.

II. Oath/Declaration

The Office Action stated that the oath or declaration for one of the inventors was defective. Applicants have enclosed herewith a new declaration in compliance with 37 C.F.R. § 1.67(a).

III. Claim Objections

The Office Action objected to Claims 1-4, 14-15, and 17-20 as referring to sequence listing numbers of nonelected inventions. Applicants have cancelled all original claims, and the new claims do not refer to the sequence listing numbers of the nonelected inventions.

The Office Action also objected to Claims 9 and 10 as being multiple dependent claims in improper form. Applicants have cancelled Claims 9 and 10 and note that the new claims refer to the other claims in the alternative only. Therefore, Applicants respectfully request that these objections to the claims be withdrawn.

IV. Rejections under 35 U.S.C. § 112, first paragraph

The Office Action rejected Claims 1, 5-10, and 17 under 35 U.S.C. § 112, first paragraph, as containing subject matter that is not described in such a manner that would reasonably convey to one skilled in the art that the inventors had possession of the invention at the time the application was filed. More specifically, the Office Action stated that the specification only describes fourteen isolated DNA molecules that encode proteins homologous to known protein kinases, ten of which improve drought stress tolerance when expressed in transgenic plants and six of which also improve freeze stress tolerance. The Office Action stated that this disclosure does not constitute a substantial portion of the genera of PKSRP coding nucleic acids, MPK-3 coding nucleic acids, and orthologs thereof that increase a transgenic plant's tolerance to an environmental stress. The Office Action concluded that the disclosure does not provide an adequate description of the claimed genus such that one skilled in the art would recognize from the disclosure that the Applicants were in possession of the claimed genus.

Applicants respectfully submit that these rejections are mooted by the Applicants' cancellation of Claims 1, 5-10, and 17. Therefore, Applicants respectfully request that the rejections with respect to the written description requirement be withdrawn.

The Office Action also rejected Claims 1-10 and 14-20 under 35 U.S.C. § 112, first paragraph, as not enabling one skilled in the art to make or use the invention commensurate in scope with the claims. The Office Action noted that the specification discloses that the elected MPK-3 coding nucleic acid when expressed in transgenic *Arabidopsis* plants increases the plant's tolerance to drought and freeze stresses; however, the Office Action concluded that this disclosure is not enabling for transgenic plants comprising other PKSRP nucleic acids with tolerance to any environmental stress and for expressing PKSRP nucleic acids in a host cell type other than a plant cell.

Applicants have cancelled Claims 1-10 and 14-20. Applicants respectfully submit that new Claim 48 (corresponding to original Claim 16) contains the phrase "plant cell" rather than the phrase "host cell." Applicants respectfully submit that based on the Applicants' present disclosure of the expression of fourteen PKSRP coding nucleic acids in a plant sufficiently

describes an appropriate level at which to express other PKSRP coding nucleic acids in a plant such that the expression results in the plant's increased tolerance to an environmental stress. Everything necessary to practice the invention need not be disclosed; what is well known in the art may be omitted. *See In re Buchner*, 929 F.2d 660, 661, 18 U.S.P.Q.2d (BNA) 1331, 1332 (Fed. Cir. 1991). Applicants respectfully submit that based on the present disclosure, one skilled in the relevant art would be capable of adjusting the level of expression of the PKSRP nucleic acid to achieve greater or lesser stress tolerance as desired. Therefore, because the specification would enable one skilled in the art to make or use the invention commensurate in scope with the claims, Applicants respectfully request that the rejections under 35 U.S.C. § 112, first paragraph be withdrawn.

V. Rejections under 35 U.S.C. § 112, second paragraph

The Office Action rejected Claims 1-10 and 14-20 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the Applicants' invention. In particular, the Office Action stated that certain phrases in these claims render the claims indefinite.

The Office Action rejected Claims 1-4, 14-15, and 17-20 as being indefinite in the recitation of "Stress-Related Protein" or "PKSRP." Applicants note that in drafting a patent application, the applicant is permitted to be his or her own lexicographer and to use his or her own terminology, provided that it may be understood by one of skill in the art and that the meaning assigned to the term is not repugnant to the term's well known usage. *See In re Hill*, 161 F.2d 367, 73 U.S.P.Q. (BNA) 482 (CCPA 1947); MPEP §§ 608.01(g), 2111.01. Accordingly, Applicants respectfully submit that they are acting as lexicographer in using the terms "Stress-Related Protein" and "PKSRP" in order to simplify the specification. Applicants note that these terms are defined in the specification, for example, in paragraph 10 on pages 3-4. The protein kinase stress-related protein (PKSRP) coding nucleic acids are defined as those nucleic acids that encode protein kinases and whose expression in a plant cell results in the plant cell's increased tolerance to an environmental stress as compared to a wild type variety of the

cell. "Stress-Related Protein" is intended to refer to the fact that the protein is related to an increase in the plant's tolerance to an environmental stress.

The Office Action rejected Claims 1, 10, and 16-17 as being indefinite in the recitation of "environmental stress." Applicants respectfully submit that the new claims recite that the environmental stress is selected from one or more of the group consisting of drought and low temperature.

The Office Action rejected Claims 1 and 17 as being indefinite in the recitation of "orthologs thereof." This rejection is mooted by the fact that Applicants have cancelled the original claims, and that the new claims do not contain this phrase.

The Office Action rejected Claims 4, 15, and 20 as being indefinite in the recitation of "hybridizes under stringent conditions." Applicants respectfully submit that the new claims recite specific stringent hybridization conditions.

The Office Action rejected Claim 8 as being indefinite in the recitation of "forage crop." Applicants note that "forage crop" appears in new Claim 40. Applicants respectfully submit that what is encompassed by the term "forage crop" would be well known by one of skill in the art. Forage crops include, but are not limited to, Canarygrass, Bromegrass, Wildrye Grass, Bluegrass, Orchardgrass, Alfalfa, Birdsfoot Trefoil, Alsike Clover, Red Clover, and Sweet Clover. *See, e.g.*, National Grassland Research Institute's Illustrated Encyclopedia of Forage Crop Diseases at <http://ss.ngri.affrc.go.jp/disease/detitle.htm>. A hard copy of information from this site is enclosed herewith.

The Office Action rejected Claims 9 and 10 as being indefinite in the recitation of the indefinite article "a." Applicants respectfully submit that this rejection is mooted by the Applicants' cancellation of the original claims.

The Office Action rejected Claim 10 as being indefinite in the recitation of "true breeding." Applicants respectfully submit that new Claim 42 (corresponding to original Claim 10) specifies that the seed comprises the PKSRP nucleic acid that was introduced into the parent plant. Applicants also respectfully submit that "true breeding" is defined in the specification in paragraph 41 on page 8 as referring to when a plant is genetically homozygous for a trait to the extent that when the variety is self-pollinated, a significant amount of independent segregation of

the trait among the progeny is not observed. A plant "variety" is defined as being a group of plants within a species that share a constant character that separates the variety from the typical form of the species and from other varieties within that species. In this case, the trait that the claimed variety has in common is the transgenic expression of the PKSRP coding nucleic acid.

Claim 17 was rejected under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. Applicants respectfully submit that the new claims include the essential step of expressing the PKSRP protein.

Applicants believe that the cancellation of the original claims and addition of the new claims have overcome the rejections under 35 U.S.C. § 112, second paragraph, and therefore, Applicants respectfully request that the rejections under 35 U.S.C. § 112, second paragraph be withdrawn.

#### VI. Rejections under 35 U.S.C. § 101

The Office Action rejected Claim 10 under 35 U.S.C. § 101, as being directed to non-statutory subject matter. The Office Action stated that the claim is not limited to a seed that comprises the PKSRP nucleic acid introduced into the parent plant. Applicants respectfully submit that the new Claim 42 (corresponding to original Claim 10) recites that the seed comprises the PKSRP nucleic acid introduced into the parent plant. Accordingly, Applicants respectfully request that the objection under 35 U.S.C. § 101 be withdrawn.

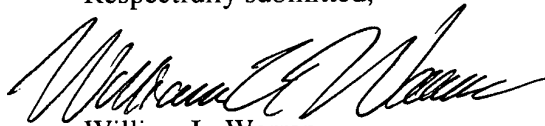
#### VI. Rejections under 35 U.S.C. § 102

The Office Action rejected Claims 1, 4, 7, 8, 9, 15, 16, 17, and 20 as being anticipated by Seo et al. (The Plant Cell, 1999, 11:289-98). The Office Action stated that Seo et al. teach transgenic tobacco plants and plant cells comprising a WIPK coding nucleic acid. The Office Action also stated that because WIPK is a MAP kinase, WIPK is necessarily a MPK-3 ortholog and would be encompassed by the claims. The Office Action also stated that a WIPK coding nucleic acid would hybridize under stringent conditions to a polynucleotide as defined in SEQ ID NO:22.

Applicants respectfully submit that the Seo et al. reference does not teach or suggest that transgenic plants comprising a WIPK coding nucleic acid would have increased tolerance to drought or freeze stress. Applicants also respectfully submit that a Pairwise BLAST comparison of the two amino acid sequences (WIPK and MPK-3) resulted in a finding of no significant homology. Therefore, Applicants respectfully submit that a WIPK coding nucleic acid would not be expected to hybridize under stringent conditions to a polynucleotide as defined in SEQ ID NO:22. Accordingly, the Seo et al. reference does not anticipate the present invention, and Applicants respectfully request that the rejection under 35 U.S.C. § 102 be withdrawn.

Applicants believe that the present application, as amended, is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. The foregoing is submitted as a full and complete response to the Office Action mailed September 10, 2002. No additional fees are believed to be due, however, the Commissioner is hereby authorized to charge any additional fees due or credit any overpayment to Deposit Account No. 19-5029. If there are any issues that can be resolved by a telephone conference or an Examiner's amendment, the Examiner is invited to call the undersigned attorney at (404) 853-8081.

Respectfully submitted,



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**Marked Up Set of the Claims**

1. (Cancelled) A transgenic plant cell transformed by a Protein Kinase Stress-Related Protein (PKSRP) coding nucleic acid, wherein expression of the nucleic acid in the plant cell results in increased tolerance to an environmental stress as compared to a wild type variety of the plant cell and wherein the PKSRP is selected from the group consisting of: Protein Kinase-6 (PK-6); Protein Kinase-7 (PK-7); Protein Kinase-8 (PK-8); Protein Kinase-9 (PK-9); Casein Kinase homologue (CK-1); Casein Kinase homologue-2 (CK-2); Casein Kinase homologue-3 (CK-3); MAP Kinase-2 (MPK-2); MAP Kinase-3 (MPK-3); MAP Kinase-4 (MPK-4); MAP Kinase-5 (MPK-5); Calcium dependent protein kinase-1 (CPK-1); Calcium dependent protein kinase-2 (CPK-2); and orthologs thereof.
2. (Cancelled) The transgenic plant cell of Claim 1, wherein the PKSRP is selected from the group consisting of PK-6 as defined in SEQ ID NO:27; PK-7 as defined in SEQ ID NO:28; PK-8 as defined in SEQ ID NO:29; PK-9 as defined in SEQ ID NO:30; CK-1 as defined in SEQ ID NO:31; CK-2 as defined in SEQ ID NO:32; CK-3 as defined in SEQ ID NO:33; MPK-2 as defined in SEQ ID NO:34; MPK-3 as defined in SEQ ID NO:35; MPK-4 as defined in SEQ ID NO:36; MPK-5 as defined in SEQ ID NO:37; CPK-1 as defined in SEQ ID NO:38; and CPK-2 as defined in SEQ ID NO:39.
3. (Cancelled) The transgenic plant cell of Claim 1, wherein the PKSRP coding nucleic acid is selected from the group consisting of PK-6 as defined in SEQ ID NO:14; PK-7 as defined in SEQ ID NO:15; PK-8 as defined in SEQ ID NO:16; PK-9 as defined in SEQ ID NO:17; CK-1 as defined in SEQ ID NO:18; CK-2 as defined in SEQ ID NO:19; CK-3 as defined in SEQ ID NO:20; MPK-2 as defined in SEQ ID NO:21; MPK-3 as defined in SEQ ID NO:22; MPK-4 as defined in SEQ ID NO:23; MPK-5 as defined in SEQ ID NO:24; CPK-1 as defined in SEQ ID NO:25; and CPK-2 as defined in SEQ ID NO:26.
4. (Cancelled) The transgenic plant cell of Claim 1, wherein the PKSRP coding nucleic acid hybridizes under stringent conditions to a sequence of SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:24, SEQ ID NO:25, or SEQ ID NO:26.

5. (Cancelled) The transgenic plant cell of Claim 1, wherein the environmental stress is selected from the group consisting of salinity, drought and temperature.
6. (Cancelled) The transgenic plant cell of Claim 1, wherein the plant is a monocot.
7. (Cancelled) The transgenic plant cell of Claim 1, wherein the plant is a dicot.
8. (Cancelled) The transgenic plant cell of Claim 1, wherein the plant is selected from the group consisting of maize, wheat, rye, oat, triticale, rice, barley, soybean, peanut, cotton, rapeseed, canola, manihot, pepper, sunflower, tagetes, solanaceous plants, potato, tobacco, eggplant, tomato, Vicia species, pea, alfalfa, coffee, cacao, tea, Salix species, oil palm, coconut, perennial grass and forage crops.
9. (Cancelled) A transgenic plant comprising a plant cell according to any of Claims 1-8.
10. (Cancelled) A seed produced by a transgenic plant comprising a plant cell according to any of Claims 1-8, wherein the seed is true breeding for an increased tolerance to environmental stress as compared to a wild type variety of the plant cell.
11. (Cancelled) An agricultural product produced by the transgenic plant or seed of Claims 9 or 10.
12. (Cancelled) An isolated Protein Kinase Stress-Related Protein (PKSRP) wherein the PKSRP is selected from the group consisting of Protein Kinase-6 (PK-6); Protein Kinase-7 (PK-7); Protein Kinase-8 (PK-8); Protein Kinase-9 (PK-9); Casein Kinase homologue (CK-1); Casein Kinase homologue-2 (CK-2); Casein Kinase homologue-3 (CK-3); MAP Kinase-2 (MPK-2); MAP Kinase-3 (MPK-3); MAP Kinase-4 (MPK-4); MAP Kinase-5 (MPK-5); Calcium dependent protein kinase-1 (CPK-1); Calcium dependent protein kinase-2 (CPK-2); and orthologs thereof.
13. (Cancelled) The isolated PKSRP of Claim 12, wherein the PKSRP is selected from the group consisting of PK-6 as defined in SEQ ID NO:27; PK-7 as defined in SEQ ID NO:28; PK-8 as defined in SEQ ID NO:29; PK-9 as defined in SEQ ID NO:30; CK-1 as defined in SEQ ID



NO:31; CK-2 as defined in SEQ ID NO:32; CK-3 as defined in SEQ ID NO:33; MPK-2 as defined in SEQ ID NO:34; MPK-3 as defined in SEQ ID NO:35; MPK-4 as defined in SEQ ID NO:36; MPK-5 as defined in SEQ ID NO:37; CPK-1 as defined in SEQ ID NO:38; and CPK-2 as defined in SEQ ID NO:39

14. (Cancelled) An isolated Protein Kinase Stress-Related Protein (PKSRP) coding nucleic acid, wherein the PKSRP coding nucleic acid codes for a PKSRP selected from the group consisting of PK-6 as defined in SEQ ID NO:14; PK-7 as defined in SEQ ID NO:15; PK-8 as defined in SEQ ID NO:16; PK-9 as defined in SEQ ID NO:17; CK-1 as defined in SEQ ID NO:18; CK-2 as defined in SEQ ID NO:19; CK-3 as defined in SEQ ID NO:20; MPK-2 as defined in SEQ ID NO:21; MPK-3 as defined in SEQ ID NO:22; MPK-4 as defined in SEQ ID NO:23; MPK-5 as defined in SEQ ID NO:24; CPK-1 as defined in SEQ ID NO:25; and CPK-2 as defined in SEQ ID NO:26.

15. (Cancelled) The isolated PHSRP coding nucleic acid of Claim 14, wherein the PKSRP coding nucleic acid hybridizes under stringent conditions to a sequence of SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:24, SEQ ID NO:25, or SEQ ID NO:26.

16. (Cancelled) An isolated recombinant expression vector comprising a nucleic acid of Claims 14 or 15, wherein expression of the vector in a host cell results in increased tolerance to environmental stress as compared to a wild type variety of the host cell.

17. (Cancelled) A method of producing a transgenic plant containing a Protein Kinase Stress-Related Protein (PKSRP) coding nucleic acid, wherein expression of the nucleic acid in the plant results in increased tolerance to environmental stress as compared to a wild type variety of the plant, comprising, transforming a plant cell with an expression vector comprising the nucleic acid, generating from the plant cell a transgenic plant with an increased tolerance to environmental stress as compared to a wild type variety of the plant, wherein the PKSRP is selected from the group consisting of Protein Kinase-6 (PK-6); Protein Kinase-7 (PK-7); Protein Kinase-8 (PK-8); Protein Kinase-9 (PK-9); Casein Kinase homologue (CK-1); Casein Kinase homologue-2 (CK-2); Casein Kinase homologue-3 (CK-3); MAP Kinase-2 (MPK-2); MAP

Kinase-3 (MPK-3); MAP Kinase-4 (MPK-4); MAP Kinase-5 (MPK-5); Calcium dependent protein kinase-1 (CPK-1); Calcium dependent protein kinase-2 (CPK-2); and orthologs thereof.

18. (Cancelled) The method of Claim 17, wherein the PKSRP is selected from the group consisting of PK-6 as defined in SEQ ID NO:27; PK-7 as defined in SEQ ID NO:28; PK-8 as defined in SEQ ID NO:29; PK-9 as defined in SEQ ID NO:30; CK-1 as defined in SEQ ID NO:31; CK-2 as defined in SEQ ID NO:32; CK-3 as defined in SEQ ID NO:33; MPK-2 as defined in SEQ ID NO:34; MPK-3 as defined in SEQ ID NO:35; MPK-4 as defined in SEQ ID NO:36; MPK-5 as defined in SEQ ID NO:37; CPK-1 as defined in SEQ ID NO:38; and CPK-2 as defined in SEQ ID NO:39.

19. (Cancelled) The method of Claim 17, wherein the PKSRP coding nucleic acid is selected from the group consisting of PK-6 as defined in SEQ ID NO:14; PK-7 as defined in SEQ ID NO:15; PK-8 as defined in SEQ ID NO:16; PK-9 as defined in SEQ ID NO:17; CK-1 as defined in SEQ ID NO:18; CK-2 as defined in SEQ ID NO:19; CK-3 as defined in SEQ ID NO:20; MPK-2 as defined in SEQ ID NO:21; MPK-3 as defined in SEQ ID NO:22; MPK-4 as defined in SEQ ID NO:23; MPK-5 as defined in SEQ ID NO:24; CPK-1 as defined in SEQ ID NO:25; and CPK-2 as defined in SEQ ID NO:26.

20. (Cancelled) The method of Claim 17, wherein the PKSRP coding nucleic acid hybridizes under stringent conditions to a sequence of SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:24, SEQ ID NO:25, or SEQ ID NO:26.

21. (Cancelled) A method of modifying stress tolerance of a plant comprising, modifying the expression of a Protein Kinase Stress-Related Protein (PKSRP) in the plant, wherein the PKSRP is selected from the group consisting of Protein Kinase-6 (PK-6); Protein Kinase-7 (PK-7); Protein Kinase-8 (PK-8); Protein Kinase-9 (PK-9); Casein Kinase homologue (CK-1); Casein Kinase homologue-2 (CK-2); Casein Kinase homologue-3 (CK-3); MAP Kinase-2 (MPK-2); MAP Kinase-3 (MPK-3); MAP Kinase-4 (MPK-4); MAP Kinase-5 (MPK-5); Calcium dependent protein kinase-1 (CPK-1); Calcium dependent protein kinase-2 (CPK-2); and orthologs thereof.

22. (Cancelled) The method of Claim 21, wherein the PKSRP is selected from the group consisting of PK-6 as defined in SEQ ID NO:27; PK-7 as defined in SEQ ID NO:28; PK-8 as defined in SEQ ID NO:29; PK-9 as defined in SEQ ID NO:30; CK-1 as defined in SEQ ID NO:31; CK-2 as defined in SEQ ID NO:32; CK-3 as defined in SEQ ID NO:33; MPK-2 as defined in SEQ ID NO:34; MPK-3 as defined in SEQ ID NO:35; MPK-4 as defined in SEQ ID NO:36; MPK-5 as defined in SEQ ID NO:37; CPK-1 as defined in SEQ ID NO:38; and CPK-2 as defined in SEQ ID NO:39.
23. (Cancelled) The method of Claim 21, wherein the PKSRP coding nucleic acid is selected from the group consisting of PK-6 as defined in SEQ ID NO:14; PK-7 as defined in SEQ ID NO:15; PK-8 as defined in SEQ ID NO:16; PK-9 as defined in SEQ ID NO:17; CK-1 as defined in SEQ ID NO:18; CK-2 as defined in SEQ ID NO:19; CK-3 as defined in SEQ ID NO:20; MPK-2 as defined in SEQ ID NO:21; MPK-3 as defined in SEQ ID NO:22; MPK-4 as defined in SEQ ID NO:23; MPK-5 as defined in SEQ ID NO:24; CPK-1 as defined in SEQ ID NO:25; and CPK-2 as defined in SEQ ID NO:26.
24. (Cancelled) The method of Claim 21, wherein the PKSRP coding nucleic acid hybridizes under stringent conditions to a sequence of SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:24, SEQ ID NO:25, or SEQ ID NO:26.
25. (Cancelled) The method of Claim 21, wherein the stress tolerance is decreased.
26. (Cancelled) The method of Claim 21, wherein the plant is not transgenic.
27. (Cancelled) The method of Claim 21, wherein the plant is transgenic.
28. (Cancelled) The method of Claim 27, wherein the plant is transformed with a promoter that directs expression of the PKSRP.
29. (Cancelled) The method of Claim 28, wherein the promoter is tissue specific.

30. (Cancelled) The method of Claim 28, wherein the promoter is developmentally regulated.

31. (Cancelled) The method of Claim 21, wherein PKSRP expression is modified by administration of an antisense molecule that inhibits expression of PKSRP.

32. (New) A transgenic plant cell transformed by a Protein Kinase Stress-Related Protein (PKSRP) coding nucleic acid, wherein expression of the PKSRP in the plant cell results in the plant cell's increased tolerance to an environmental stress as compared to a wild type variety of the plant cell, wherein the environmental stress is selected from one or more of the group consisting of drought and low temperature, and wherein the PKSRP is a Physcomitrella patens PKSRP.

33. (New) The transgenic plant cell of Claim 32, wherein the PKSRP is a MPK-3 protein as defined in SEQ ID NO:35.

34. (New) The transgenic plant cell of Claim 32, wherein the PKSRP coding nucleic acid comprises a polynucleotide as defined in SEQ ID NO:22.

35. (New) A transgenic plant cell transformed by a Protein Kinase Stress-Related Protein (PKSRP) coding nucleic acid, wherein the PKSRP coding nucleic acid hybridizes under stringent conditions to at least one sequence selected from the group consisting of the sequence of SEQ ID NO:22 and the full-length complement of the sequence of SEQ ID NO:22, and wherein the stringent conditions comprise at least one wash in a 0.2X sodium chloride/sodium citrate (SSC), 0.1% SDS solution at 50oC.

36. (New) The transgenic plant cell of Claim 35, wherein the stringent conditions comprise an initial hybridization in a 6X SSC solution at 45oC followed by at least one wash in a 0.2X SSC, 0.1% SDS solution at 50oC.

37. (New) A transgenic plant cell transformed by a PKSRP coding nucleic acid, wherein the PKSRP coding nucleic acid comprises a polynucleotide encoding a polypeptide having at least 80% sequence identity with a polypeptide as defined in SEQ ID NO:35.

38. (New) The transgenic plant cell of any of Claims 32, 33, 34, 35, or 37, wherein the plant is a monocot.

39. (New) The transgenic plant cell of any of Claims 32, 33, 34, 35, or 37, wherein the plant is a dicot.

40. (New) The transgenic plant cell of any of Claims 32, 33, 34, 35, or 37, wherein the plant is selected from the group consisting of maize, wheat, rye, oat, triticale, rice, barley, soybean, peanut, cotton, rapeseed, canola, manihot, pepper, sunflower, tagetes, solanaceous plants, potato, tobacco, eggplant, tomato, Vicia species, pea, alfalfa, coffee, cacao, tea, Salix species, oil palm, coconut, perennial grass, and a forage crop.

41. (New) A transgenic plant comprising a plant cell according to any of Claims 32, 33, 34, 35, or 37.

42. (New) A seed produced by a transgenic plant comprising a plant cell according to any of Claims 32, 33, 34, 35, or 37, wherein the seed comprises the PKSRP nucleic acid, wherein the seed is true breeding for an increased tolerance to an environmental stress as compared to a wild type variety of the plant cell, and wherein the environmental stress is selected from one or more of the group consisting of drought and low temperature.

43. (New) An isolated Protein Kinase Stress-Related Protein (PKSRP) coding nucleic acid, wherein the PKSRP coding nucleic acid comprises a polynucleotide that encodes a polypeptide as defined in SEQ ID NO:35.

44. (New) The isolated PKSRP coding nucleic acid of Claim 43, wherein the PKSRP coding nucleic acid comprises a polynucleotide as defined in SEQ ID NO:22.

45. (New) An isolated PKSRP coding nucleic acid, wherein the PKSRP coding nucleic acid hybridizes under stringent conditions to at least one sequence selected from the group consisting of the sequence of SEQ ID NO:22 and the full-length complement of the sequence of

SEQ ID NO:22, and wherein the stringent conditions comprise at least one wash in a 0.2X sodium chloride/sodium citrate (SSC), 0.1% SDS solution at 50oC.

46. (New) The PKSRP coding nucleic acid of Claim 45, wherein the stringent conditions comprise an initial hybridization in a 6X SSC solution at 45oC followed by at least one wash in a 0.2X SSC, 0.1% SDS solution at 50oC.

47. (New) An isolated PKSRP coding nucleic acid, wherein the PKSRP coding nucleic acid comprises a polynucleotide encoding a polypeptide having at least 80% sequence identity with a polypeptide as defined in SEQ ID NO:35.

48. (New) An isolated recombinant expression vector comprising an PKSRP coding nucleic acid of Claims 43, 44, 45, or 47, wherein expression of the PKSRP in a plant cell results in the plant cell's increased tolerance to an environmental stress as compared to a wild type variety of the plant cell, and wherein the environmental stress is selected from one or more of the group consisting of drought and low temperature.

49. (New) A method of producing a transgenic plant containing a Protein Kinase Stress-Related Protein (PKSRP) coding nucleic acid, wherein expression of the PKSRP in the plant results in the plant's increased tolerance to an environmental stress as compared to a wild type variety of the plant, comprising,

- a. transforming a plant cell with an expression vector comprising the nucleic acid; and
- b. generating from the plant cell a transgenic plant with an increased tolerance to an environmental stress as compared to a wild type variety of the plant,

wherein the PKSRP is a Physcomitrella patens PKSRP, and wherein the environmental stress is selected from one or more of the group consisting of drought and low temperature.

50. (New) The method of Claim 49, wherein the PKSRP is a MPK-3 polypeptide as defined in SEQ ID NO:35.

51. (New) The method of Claim 49, wherein the PKSRP coding nucleic acid comprises a polynucleotide as defined in SEQ ID NO:22.

52. (New) A method of producing a transgenic plant containing a Protein Kinase Stress-Related Protein (PKSRP) coding nucleic acid, wherein expression of the PKSRP in the plant results in the plant's increased tolerance to an environmental stress as compared to a wild type variety of the plant, comprising,

- a. transforming a plant cell with an expression vector comprising the nucleic acid; and
- b. generating from the plant cell a transgenic plant with an increased tolerance to an environmental stress as compared to a wild type variety of the plant,

wherein the PKSRP coding nucleic acid hybridizes under stringent conditions to at least one sequence selected from the group consisting of the sequence of SEQ ID NO:22 and the full-length complement of the sequence of SEQ ID NO:22, wherein the stringent conditions comprise at least one wash in a 0.2X sodium chloride/sodium citrate (SSC), 0.1% SDS solution at 50oC, and wherein the environmental stress is selected from one or more of the group consisting of drought and low temperature.

53. (New) The method of Claim 52, wherein the stringent conditions comprise an initial hybridization in a 6X SSC solution at 45oC followed by at least one wash in a 0.2X SSC, 0.1% SDS solution at 50oC.

54. (New) A method of producing a transgenic plant containing a Protein Kinase Stress-Related Protein (PKSRP) coding nucleic acid, wherein expression of the PKSRP in the plant results in the plant's increased tolerance to an environmental stress as compared to a wild type variety of the plant, comprising,

- a. transforming a plant cell with an expression vector comprising the nucleic acid; and
- b. generating from the plant cell a transgenic plant with an increased tolerance to an environmental stress as compared to a wild type variety of the plant,

wherein the PKSRP coding nucleic acid comprises a polynucleotide encoding a polypeptide having at least 80% sequence identity with a polypeptide as defined in SEQ ID NO:35, and wherein the environmental stress is selected from one or more of the group consisting of drought and low temperature.